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LECTURES ON THE EXPLORATION AND TREATMENT OF DISEASES OF THE CHEST.

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Lecture IV. and V.—*Auscultation.*

We now come to the most important and extended means of physical exploration,—that is, auscultation, or the act of hearing and interpreting the sounds produced in the chest during the act of respiration, or of coughing or speaking, or caused by the action of the heart. Percussion teaches us merely the density of the tissue of the lungs; but auscultation goes much farther, and not only indicates the physical density of the tissue, but the functional play of the organs, and the obstructions which impede the passage of the air in the lungs, or of the blood in the heart. Hence the signs of auscultation are much more functional than those of percussion; they are developed by the patient himself, and of course cease with the termination of life. They are more complicated in their nature than the signs of percussion, and are less positive, because they may be modified by a greater number of circumstances: but when these are taken into the account, the deductions from auscultation are quite as conclusive.

The mode of practising auscultation is extremely simple; you may apply your ear directly to the chest, or you may interpose between it and the thorax of the patient a solid or flexible tube; hence auscultation is either immediate or mediate. As the sounds are produced by the patient, and not by your hand, as in percussion, you have thus far a very easy task; but you will find it of more difficulty when you come to the sounds themselves, and to their interpretation. Some, in themselves, are not easily learned; but others are difficult, only because they differ one from another by slight shades, and may therefore readily be confounded together.

For most purposes, immediate auscultation, or the direct application of the ear to the chest, is preferable to the use of a conducting tube. Those who are perfectly habituated to the exploration of the chest, prefer this method in the great majority of cases, on account of its greater rapidity and facility of application, for there is no previous preparation necessary, nor is there any difficulty in passing the ear rapidly over the chest. But in those portions of the thorax, where the space for the application of the ear is extremely limited, such as the clavicular regions and the axillæ, or above the mammæ in females, the stethoscope, as the conducting tube is called, will be found preferable. Besides these reasons of mere expediency, the sounds themselves are sometimes better characterized, or at least better limited in immediate auscultation; this is the case with the heart, and even with the lungs; for, as the instrument covers but a small space, and is perfectly isolated from the rest of the chest, the sound which is produced in the limited portion covered by its extremity, is alone conducted to the ear,—and that coming from the adjoining parts of the thorax is not heard, or at least is so feebly heard that it does not materially interfere with the result. When we apply the ear, we place the large surface of the head in contact with the chest, and as the bones of the chest and head are tolerably good conductors of sound, we hear the sounds of a larger portion of the lung than is desirable, and acquire less precise notions. But when you wish to examine rapidly a large portion of the chest, you will gain much time from this very circumstance, and take in at once the sounds from a large space, such as a whole lobe of the lung, or nearly so; and if you are really familiar with the sounds, they can be analysed and distinguished one from another, though heard at the same time, just as several instruments can be recognised in the same piece of music played by a complete orchestra. For ordinary purposes, therefore, immediate auscultation is much to be preferred.

When you use an instrument for conducting the sound from the chest to the ear, you will be obliged to take more precautions. This instrument is called a stethoscope, and is nothing more nor less than a tube of light wood, such as

cedar; the extremity which is to be applied to the chest, is hollowed into the form of a cone, the apex of which terminates in the tube, and, of course, serves as an ear trumpet to conduct the sounds. The substance of the tube, although a comparatively good conductor of sound, is of much less service than the column of air; for an ordinary flexible ear-trumpet in which the sound is conducted exclusively by the column of air, is an excellent stethoscope. The diameter of the base of the cone should be from an inch to an inch and a quarter; if it be much larger, the sounds are confused, and the instrument loses its greatest advantage, that of concentrating the sound within a limited space; if too small, the sound is not loud enough. The essential point in the construction of a stethoscope is, that its cone should be deep and well hollowed out, at least an inch and a half or two inches deep, as is the case with several of the instruments which I now show you. The length of the tube may vary from four or five inches to a foot; six or seven inches will be found to be of a very suitable length for most purposes. The ear piece should be slightly convex or flat, or you may have a nipple-shaped projection, to insert into the ear; it should be of the same material as the rest of the tube, and not of ivory, as is often the case. Your ear will not be so near the chest as to expose you to the inconvenience of immediate auscultation, nor so far removed from it as greatly to diminish the intensity of the sound, for the sound becomes more gradually less and less loud in proportion as the ear is further removed from the part of the lung in which it is produced.

A flexible tube, that is an ordinary ear trumpet, about eighteen inches long, with the open end brought nearly to the form of the extremity of the stethoscope, is the best instrument for the examination of the sounds of the heart, as it does not conduct the impulse to the ear, hence the sounds alone are heard without the impulsion, which renders their analysis more difficult. Dr. Pennock of this city, who has devoted great attention to the diseases of the heart and their signs, was the first to introduce the flexible tube for this purpose, instead of the ordinary stethoscope.

I do not wish to detain you longer with the description of the mere instrument of hearing, which you may procure from any turner, but I must give you some cautions respecting the mode of application of the stethoscope. If you apply it directly upon the chest you must take great care that the end be placed flat upon the skin, without inclining to one or the other side, as the sounds are both modified and lessened by the admission of the air between the thorax and the tube. Indeed it is better not to place the instrument immediately upon the skin, but upon an under garment of muslin or flannel; this fills up the interstices between the tube and the surface, and prevents pain from too strong a pressure. The covering must be thin and not stiff, hence starched linen and silk are both improper, as they give rise to a rustling sound, and obscure the respiratory murmur.

The position of the patient for auscultation should be similar to that already directed for percussion, but the muscles and skin need not be drawn as tensely upon the ribs, for the pressure of the ear or the stethoscope against the chest will supply the effort performed by the muscles, and bring the parts as closely together as is desirable.

The signs derived from auscultation are divided into those of the respiration, of the voice, and cough, and lastly, of the heart. The signs of the respiration include both the modifications of the natural sounds produced by disease, and the rhonchi, or the new sounds, which are totally unlike those heard in the normal state. The latter class of signs are simple, and readily learned; the former are more important, and are produced by deeply seated alterations of the substance of the lung, producing a change in the density of its tissue. These signs are always attended with corresponding alterations in the percussion, and the resonance of the voice, which depend upon the same changes in the vesicular structure, and in the permeability of the bronchial tubes. They are thus learned, as it were, in connexion; and the signs of the respiration are strengthened or disproven by the corresponding changes in the voice and the percussion. Hence you will find it more easy to acquire them than it otherwise would be, for you may verify for yourselves at every step of your examination, and gradually acquire confidence in your powers of discrimination.

The morbid alterations of the respiration are well marked in extreme cases, but gradually

pass into the characters of the healthy respiration; hence there is but one way of learning these signs. First to acquire the signs when strongly characterized, and then to proceed to the cases in which the modifications of respirations are but slight. In the diseased subject you will find that the strongly marked signs are very easily recognised; and many of you, who follow my practical demonstrations with sufficient attention, will naturally begin your study by the examination of patients who present these signs. Still, the facility for examining individuals in health is so much greater, that I should advise you all to familiarize and train your ear by the attentive study of those sounds presented by healthy individuals which approach most nearly to the signs of disease. And you will find that the characteristics of the radical sounds exist both in the healthy individual and in many diseased conditions.

These characters in healthy individuals are founded upon the peculiarities of the sounds in different parts of the chest dependent upon the differences in the tissue. The lungs consist of tubes conducting the air to vesicles in which the arterialization of the blood takes place. The sound of the air entering the vesicles is different from that caused by its passage through the tubes; and the former is therefore known as the vesicular sound, the latter as the tubal or blowing sound. The vesicular sound is often called a murmur, from its softness and diffusion over a large space, and cannot be produced unless the vesicles are healthy, or nearly so. If you keep up artificial respiration in an animal stunned by a blow on the head, or suddenly killed, and apply your stethoscope upon the exposed lung, the murmur is heard very distinctly during the inspiration, so that you have direct evidence that the sound is produced by the passage of the air into the vesicles; the vesicles, however, empty themselves in a noiseless manner, and the expiration is therefore nearly unheard. The tubal or blowing sound is quite different in its character; it is evidently produced by the passage of the air through tubes, and is heard very evidently both in the inspiration and expiration,—and is, in fact, much more distinct in the latter. The cause of this difference seems to be the different manner in which the air impinges upon the vesicles and tubes. During the inspiration the terminating point is of course the air vesicles,—and the air, if forced into them with tolerable rapidity, produces a sound; this is the same, whether the impelling force be the pressure of the atmosphere, upon the column of air in the bronchial tubes, when the parietes of the chest are elevated by muscular action, or to the force communicated by the bellows, when artificial respiration is carried on. This sound is in part owing to the vibration of the air, and in part to the noise produced by the dilating of the vesicles themselves. At least, the sudden dilatation of a partially collapsed vesicle is, in all probability, attended with sound, caused by the membranes; for, when the parietes of the vesicles are thickened, the sound probably becomes louder and more distinct. It is a point, however, which is difficult to decide, and one that is of little practical moment,—for, admitting either explanation, it is equally necessary that the vesicles should be clear, and that the air should pass freely into them from the adjoining tubes. The expiration produces a faint, vesicular sound; almost no sound in those portions of the lungs where the vesicular tissue is not traversed by bronchial tubes of a certain calibre. This probably depends upon the gradual manner in which the pressure upon the vesicles expels the air from them into the larger tubes through which it may readily pass towards the exterior: as the air is forced out from the vesicles very slowly, and of course not in a regular stream or current, they contract without sound. The vesicular murmur is compared to various sounds not very like to it; but it can be learned only in one way,—that is, by listening to those portions of the chest in which it exists in the greatest purity, especially towards the lower and lateral portions of the lungs. The murmur will be found to vary in intensity in different individuals: in some it is always feeble, and in others comparatively loud. It is loudest in those persons of a nervous temperament in whom the necessity for rapid respiration is greatest, than in stouter individuals. It is also louder in women and in children than in men and adults. The vesicular sound is indeed so much louder in children, that the term puerile respiration is used as synonymous with loud and full vesicular sound.

In most persons, the dilatation of the vesicles is obviously incomplete, except in forced inspirations, and in some is much more so than in others. This imperfect dilatation is rather more marked at the lower portions of the lungs than the upper, probably from the longer course and smaller size of the bronchial tubes, which require a more powerful effort to produce their full distension.

The tubal respiration is often called bronchial, from its production in the larger bronchial tubes,—or tracheal, from its development in the trachea,—the term tubal being thus confined to the most intense degree of this sound. In the healthy individual this may be heard in a very marked degree at the trachea, immediately above the sternum, and the air is then heard very easily as it passes through it, both in this inspiration and expiration. The sound is always blowing, and very different from the vesicular murmur; this character is best marked in the expiration. The cause of this difference will be very obvious to you if you attend to your own respiration; you will find then, if you breathe rapidly, that the expiratory sound, which is heard out of the chest, is much louder than the inspiratory, and is produced in the upper portion of the bronchial tree, and in the nasal fossæ, where the air passages are large, and the rapidity of motion of the air is greatest. It is for this reason, in the trachea the respiration is most decidedly tubal, or if you choose to use the term, tracheal. It gradually becomes less and less so as you approach more nearly to the parts of the lungs where the vesicular structure is most abundant, and contains tubes of the smallest calibre, and most removed from the surface. You may thus analyze the different sounds heard in various parts of the respiratory passages; you will find then the blowing sound only at the trachea, and the vesicular only at the lower parts of the chest,—while at the roots of the lungs there is a mixture of the two varieties of sound, and the vesicular is combined with the blowing sound. Passing from the root of the lung you will find a gradual diminution in the loudness of the bronchial sound,—but it is still heard as far as the summit, and much more distinctly on the right side than on the left. The difference in the two sides arises from the anatomical structure; for the tubes leading to the upper part of the right lung are shorter and larger than those going to the left, on which side the large bronchus passes under the aorta, and is therefore much longer and more tortuous than upon the right. The larger but shorter tubes of course approach much more nearly than the longer and smaller ones to the physical condition of the trachea, in which the air circulates with such freedom as to give rise to the loudest double blowing sound. The louder blowing sound exists on the right side, both at the anterior and posterior part; hence a given amount of induration of structure, which may tend to increase the loudness of this sign, will be much more perceptible on the right side than on the left,—while, on the other hand, in the state of health, a perfectly natural peculiarity may be mistaken for disease. The blowing sound, if it be heard only on the right side, must be well characterized to become a sign of disease, and is not of much value unless combined with other corroborative evidence.

This difference of respiratory sound on the two sides of the chest dependent upon the different structure of the lungs, was not pointed out previously to some researches which I undertook upon the subject, at the Children's Hospital of Paris, about eight years ago. My attention was called to the subject by the observation made by my lamented friend Dr. Jackson of Boston, who laid great stress upon the characters of the expiration observable in commencing phthisis, and other diseases attended with consolidation of the lung. His remarks upon the early development of the blowing expiration in commencing phthisis, were perfectly well founded; but at the commencement of his researches he was sometimes led into error from not making due allowance for the difference of the two sides dependent upon peculiarities of conformation.

In the study of the respiration you have a plain course to follow: examine as often as you can the region of the trachea, and then the lower and vesicular portion of the lungs, and thus fix in your minds the difference between the two leading varieties of the respiration, or the tubal and the vesicular. Some of you find this study a matter of some difficulty, while others can seize the distinctive characters at their first effort. You must not be in doubt as to the cause of this difficulty when it exists; it arises in part from a less acuteness of hear-

ing, but much more from a defect of attention, which you may readily supply by your own efforts; and, rely upon it, you know nothing of auscultation until you have mastered this subject. After the best marked sounds are learned, you may proceed to those parts of the chest in which you will hear the two varieties of the respiration at the same time; you then analyze their peculiarities, and may ask yourselves at each moment whether you have a clear idea of both sounds, as they are heard together. The same process should be repeated in different individuals of various ages, sex, and conformation; and you will find that although they present numerous shades of difference, the radical features are the same, and must always be the same, for they depend on known principles of acoustics.

In connexion with this part of your studies, you may properly enough accustom yourselves to the shades of difference offered by the parts of the lung, where other viscera, such as the heart and liver, occupy a portion of the space beneath the ear, and you may in this way learn the abrupt manner in which the respiration generally ceases at the level of the lung. During your examination you should direct the patient to breathe with different degrees of rapidity, sometimes quite naturally, and at others much more quickly, so as to force the air into the vesicles. In the examination of diseased individuals we follow nearly the same order,—and, after placing our ear for a moment upon the chest of the patient while breathing in a quiet and regular manner, we usually direct him to make a forced inspiration, which clears out the mucus in the bronchial tubes, and supplies a full proportion of air to each vesicle. In cases of disease of an acute character obstructing a portion of the lung, there is no necessity for directing the patients to breathe rapidly, as the obstruction in the diseased part of the lung causes the respiration in the rest of the pulmonary tissue to be much exaggerated or puerile.

After the radical characters of tracheal or bronchial respiration, which differ merely by a shade, of the vesicular respiration, and of the rude respiration, which is intermediate to the two leading varieties are learned, you may proceed to the study of the morbid alterations of the respiratory sounds. These are classed according to their greater or less accordance with the natural characters of the respiration. I will begin with the most strongly marked. This is the bronchial respiration, and its varieties, which include the cavernous and amphoric respiration. The bronchial respiration, as it occurs in a diseased lung, is essentially the same with the tracheal respiration of the healthy chest. The bronchial respiration is developed by causes which harden the parenchyma of the lungs, and destroy the vesicular texture: these are the infiltration of the tissue of the lungs with blood and plastic lymph in pneumonia, the compression of the lung by pleuritic effusions, and the deposits of various anomalous productions, such as tubercle and cancer, in the tissue of the lungs. If the induration be seated around the larger bronchial tubes, the bronchial respiration is much louder than in the portions of the lung where the tissue is chiefly composed of vesicles, for the essential cause of this sound is the passage of the air through the tubes; the induration of the substance of the lung is merely a favourable circumstance which developes the sound where it is not generally heard, or increases it in those parts of the lung in which it exists naturally. The bronchial respiration is produced then partly by the obliteration of the vesicles, and partly by the closure of the smaller tubes. Hence, the air in passing through tubes of a certain size is suddenly interrupted and repelled from their sides, because their terminating branches are closed. This repulsion produces sound, and increases the blowing respiration, which is heard most loudly when the air, instead of diffusing itself throughout the vesicular tissue, is, on the contrary, forced through the larger bronchi, which are converted into closed cylinders, from the occlusion of their branches by the progress of the disease.

The bronchial respiration is often accounted for in the following way: The passage of the air in the tubes is, under ordinary circumstances, not attended with sound; as the surrounding tissue is a bad conducting medium, and deadens the sound. When this tissue is rendered more solid, the sound already produced in the tubes becomes audible, and is conducted to the ear. This explanation is valid only to a certain extent; the sound heard exists only in a slight degree in the natural state, for a tube through which the air is con-

stantly and equally drawn during the respiration, gives rise to a very faint sound, but if the tubes passing into it be cut off, the passage of the air is at once hurried by its friction against the parietes of the bronchus, giving rise to the usual bronchial sound. In disease, therefore, the blowing sound is very often much louder in those portions of the lung where it does not exist naturally, than over the trachea or the larger tubes, which are almost immediately beneath the ear; and this extreme loudness depends upon the circumstance to which I have already alluded,—that is, the sudden reflection of the column of air from the interrupted tube.

The large size of the tubes is, however, as I have already stated, a circumstance highly favourable to the development of bronchial respiration; and if the tubes be superficial, the influence of size becomes more obvious. If the tubes be enlarged, while the parenchyma remains healthy, the respiration is bronchial, but to a less degree than if the tissue be hardened, and the tubes retain their usual calibre; for the induration is a more efficient cause of bronchial respiration than simple enlargement of the tubes.

The bronchial respiration is not perfect except when the induration of the pulmonary tissue is complete; this takes place in a few cases of phthisis, and in pleurisy with large deposit of lymph, but is much more frequent in pneumonia than in any other disease, for in none other is the hardening of the tissue so perfect: this sign is therefore one of the best indications of the second stage of inflammation. In dilatation of the tubes the respiration becomes very bronchial when the surrounding tissue is indurated, that is, when complicated with pneumonia.

The bronchial respiration, then, is produced by the passage of the air through tubes of the middle and larger size in an indurated lung, and also by the enlargement of these tubes. The cavernous respiration is another variety of sound which is closely analogous to the bronchial respiration, and depends upon the passage of the air into a cavity communicating with the bronchi. For physical purposes this cavity may be considered as a mere dilatation of the bronchus with which it communicates; but as the termination of the tubes themselves is never so abrupt as the morbid cavity, the air in the bronchial respiration proper is gradually diffused through the tissue, and is slowly lost,—but in the cavity it is abruptly reflected from the walls of the excavation, and therefore seems to be more circumscribed, and comes from a limited point. This diffusion of sound in the one case, and concentration in the other, constitute the difference between these variations, and they therefore run into each other by insensible shades. As the line of distinction is an arbitrary one, it is sometimes impossible to discriminate between them, but it is not generally a matter of much practical moment, for the signs of a cavity generally become more and more distinct in proportion to the duration of the disease, and the doubtful usually become clear in a short time.

The amphoric respiration is a modification of the same sound, but is more unlike the bronchial respiration. It is produced by the passage of the air into a large cavity with firm walls. If the communication between the cavity and the bronchi be free, the expiration is also loud, and the sign differs from the cavernous respiration in one respect only—it is fuller and more musical, somewhat similar to the sound caused by blowing into a glass or metallic vessel. Both the inspiration and expectoration are blowing, and there is no trace of the vesicular murmur. If the communication with the bronchi be interrupted, or too small to allow of the free passage of the air, the inspiration alone is distinctly heard, as the air passes out of the cavity too slowly to produce much sound. The common cause of amphoric respiration is a large tuberculous cavity near the surface, and surrounded by indurated lung. It may also depend upon perforation of the pleura; in which case the amphoric tone is extremely well marked, as the cavity is much larger than one formed in the lungs, and its walls are large and elastic. If the amphoric respiration depend upon a gangrenous cavity, it is generally less marked than in tuberculous excavations, as the surrounding tissue is usually soft, and is therefore a bad conductor of sound.

We now return to the bronchial respiration as our standard of comparison, and pass from it to the vesicular murmur, reversing the order we have just followed. The varieties of the respiration intermediate between the vesicular murmur and the true bronchial respiration, are

very numerous, but they are properly enough classed under the general designation of rude, or rough respiration, which is applied to those varieties in which the vesicular murmur is still retained, but the blowing sound is at the same time more developed than is natural in the part of the lungs where it is heard. It may be attended with a feeble or an increased loudness of the vesicular murmur. When this is more feeble, the obstruction to the air occurs about the smaller tubes, and gradually compresses them; when loud, the morbid deposit is situated rather in the course of the larger tubes than at their terminating branches, which still receive their full supply of air while the respiration becomes blowing from the increased conducting power of the hardened tissue. The rude respiration is one of the most interesting varieties of the respiratory sound, for it occurs in those varieties in which the lesion is not yet much advanced, and a portion of the pulmonary tissue remains permeable to the air; hence it is a sign of the earlier stages of phthisis, of the commencement of pneumonia and of pleurisy. It is a sign which you will learn with some difficulty, because both the primitive varieties of the respiration are present, and they can only be separated by a careful analysis.

From the rude respiration we naturally return to the vesicular murmur; which may be exaggerated, or enfeebled, but still retain its essential characters. The exaggerated or puerile respiration, generally depends upon disease in other portions of the lungs than those in which it is heard. The healthy portions then perform double duty, and arterialize more than their proper share of blood. From the occurrence of puerile respiration in a part of the lung of a patient who labours under dyspnœa, we can very often determine that some obstruction must exist in other parts of the lungs; and from the knowledge of the acute and chronic diseases which generally give rise to this obstruction, we can with tolerable certainty discover the nature of the lesion. The respiration is rendered feeble in disease, either by the compression of the vesicles from effusion upon the exterior of the lung, or the development of solid matter in the parenchyma, or lastly, from obstruction of the smaller tubes.

There are some other varieties of the respiration, which it were difficult to bring within a systematic description; they should be learned after the leading varieties have been first studied. They generally arise from slight changes in the condition of the vesicles or smaller tubes, and sometimes from the mode in which the respiration is performed, but rarely depend upon important organic changes in the lung. They may be reduced to the following: 1st, the incomplete or interrupted respiration; in this variety the inspiratory sound seems to be arrested before the air passes completely into the vesicles; it arises from two causes,—a nervous spasm, and a partial thickening or congestion of the smaller tubes. It is a peculiarity which is often observed when we examine for the first time a nervous, sensitive patient, who is alarmed by the exploration of the chest; and it is sometimes met with in the infiltrated or congested state of the lungs which attends the forming stage of tuberculous disease, as well as certain varieties of bronchitis. 2d. The rustling sound of the respiration is one of the characteristics of emphysema, in which the vesicles dilate and contract with difficulty, and seem to produce sound rather from the rustling of the membrane, than the air which impinges against it.—There are other and slighter deviations from the natural tone of the respiratory murmur; but, although they are very obvious to an experienced eye, yet they are neither sufficiently permanent nor well marked to be reduced into a systematic classification.

The varieties of the respiratory sound correspond with varieties in the resonance of the voice, which often are nearly as well characterized; still, the natural tone of the voice has so much influence upon its aptness for vibration, that the signs are not always as perfectly distinctive as those of the respiration. In the ordinary act of speaking the voice vibrates throughout the chest; and if the hand be placed upon its parietes, a slight tremour is very perceptible; if you apply your ear to it, you will hear a thrilling, but distant and confused sound. This sound becomes louder, and is brought nearer to the ear, if you listen near the summit of the lungs, especially on the right side, or at their root; and if you then place the stethoscope upon the trachea, you find the resonance loud, and the words pronounced nearly as distinctly as they are by the mouth. In fact, the voice is conducted by the column of air, and then articulated words seem to enter

the ear from the trachea. This distinct and loud resonance at the trachea is pectoriloquy; and it is in this situation very perfect, especially if the voice of the individual be naturally clear, and rather shrill. At the sternum, and at the root of the lungs between the scapulæ, the resonance is less perfect, and the voice seems to enter the ear less completely than in pectoriloquy; it is therefore not quite so well characterized a sign, and is called from its position, bronchophony. In the rest of the lung the resonance of the voice is gradually less and less as you pass from the bronchi to the vesicular structure, where you hear nothing but a faint vibration.

There is, therefore, a uniform relation between the voice and the respiration, the resonance of the voice being greatest when the blowing sound of respiration is most intense. In disease the same proportion exists; a cavity gives rise to cavernous respiration in breathing, and to pectoriloquy in speaking,—and a consolidated lung, especially around the large bronchi, produces bronchophony and bronchial respiration. The same relation exists between a mere loud resonance of the voice and rude respiration, and between the ordinary vesicular murmur and a slight thrilling vibration of the voice. In cases in which the murmur is enfeebled, the resonance of the voice is less; but sometimes there is a low, purring sound, communicated to the ear as well as the hand, which is analogous to the rustling sound of emphysema, and depends upon the same causes. The blowing respiration may continue very loud when the resonance of the voice has become quite feeble, for an accumulation of mucus may be forced aside by a full inspiration, but cannot be thrown out of the way by the act of speaking, and therefore obstructs the vibration of the column of air: in these cases it is not, however, totally destroyed, for the sound is conducted by the hardened lung from the neighbouring tubes.

When a cavity in the lungs is very large, there is, of course, amphoric respiration at the same time. You will then find amphoric resonance of the voice, which often scarcely differs from pectoriloquy: that is, if the cavity be not much larger than a hen's egg, and its walls remain firm. But if the cavity increase much beyond this size, the resonance of the voice is extremely metallic, or has a clear ringing sound, which, like the respiration, is very similar to that produced by speaking in a glass bottle without quite closing its mouth.

But when the large cavity is situated in a soft permeable portion of the lung, the amphoric respiration may be obscure, like the resonance of the voice under the same circumstances.

The bronchial respiration which results from pleuritic effusions, differs so slightly from the other varieties, that it is usually not separated from them, but the resonance of the voice which takes place under the same circumstances, is very different. Its vibration is very great, and is so peculiar that the sound is called egophony, from the bleating tone of the voice, somewhat similar to that of a goat or sheep. This is not an invariable result of pleuritic effusions, but it is produced in all cases in which the effusion is sufficient to compress the lung without entirely flattening it out. If the quantity of liquid happens to be very great, but the lung stiff and more solid than usual from previous inflammation of its substance, its egophony continues longer than it otherwise would do, and rarely ceases during the course of the disease.

The signs of the voice are learned by the same process as those of respiration. After having acquired a good general idea of the characters of the respiration, you should examine them in connection with the signs of the voice, confirming or disproving one by the other, and then practising percussion, which will throw additional light upon the subject. You need not, of course, restrict yourselves to the healthy subject, but you may also study those cases of diseased lungs in which the diagnosis is comparatively easy from the functional signs, such as examples of decided phthisis and pneumonia, and then search for cavernous and bronchial respiration, with the connected signs of the voice and percussion.

The cavernous resonance of the voice in pectoriloquy was the first physical sign discovered by Laennec. He happened to place some paper rolled up into the form of a cylinder upon the chest of a patient, in order to feel the pulsations of the heart, when he was surprised to find that, during the act of speaking, the voice of the patient seemed to enter his ear. He examined immediately the chest of a large

number of patients in the same way, and detected the same phenomena in a great number who were evidently labouring under advanced phthisis; the cause of this was afterwards found to be cavities in the lung communicating with the bronchial tubes. Pectoriloquy was divided by him into three varieties, the perfect, the imperfect, and the doubtful; in the perfect, the voice seemed to pass through the stethoscope (which Laennec always used) to the ear, in the second to enter the tube, and in the third the resonance was quite confused. These distinctions are of little value and rather tend to confuse your ideas.

The following table will give you the relation between the voice and the respiration.

Amphoric Respiration,	Amphoric Resonance of Voice,
Cavernous Respiration,	Pectoriloquy,
Bronchial Respiration,	Bronchophony,
Rude Respiration,	Strong Resonance of Voice,
Vesicular Respiration,	Slight Thrilling of Voice.

A NOTICE OF THE LATE FREDERICK TURNPENNY, M. D.

[Communicated for the Medical Examiner.]

Died, on the evening of the 2d inst, in the 31st year of his age, FREDERICK TURNPENNY, M. D.

The brief career of this estimable physician was distinguished by a force of intellect, and an enthusiastic devotion to professional pursuits, which gave promise of future eminence and usefulness.

Being destined by his friends for a pharmaceutist, Dr. Turnpenny was apprenticed at an early age to a respectable apothecary, and acquired with extraordinary facility and rapidity, not only a practical acquaintance with the art, but a thorough scientific knowledge of materia medica and pharmacy. At the age of 20 he was suffered to abandon his pursuit, and to devote himself to the study of medicine: he accordingly entered as a pupil with the late lamented Dr. Parrish, for whom he entertained the warmest esteem and affection. He had long cherished a desire to pursue medical studies, and entered upon the task with a degree of energy and enthusiasm, which did not forsake him during the whole course of his pupilage.

He graduated at the University of Pennsylvania in the year 1832, being conspicuous amongst his fellows for rare medical attainments, and superior talents. He commenced practice in Philadelphia this year, and soon found ample opportunity for the exercise of his skill, by the appearance of the epidemic cholera. He was chosen by Dr. Jackson as one of his assistants in the cholera hospital under his direction, and signalized himself by his skilful and unremitting attentions to the duties of this station.

His success as a practitioner was equal to his most sanguine expectations. Few men have risen more rapidly in public confidence and esteem, or have been better able to sustain the rank which may have been assigned them by partial friends. Dr. Turnpenny possessed a native aptitude for the profession, which, combined with a highly pleasing address, and with the most persevering and assiduous attention to every professional duty, constituted the basis of a reputation, which, had his life been prolonged, would doubtless have placed him in the front rank of his profession.

Unlike many physicians who become absorbed in practical duties, Dr. Turnpenny devoted much of his leisure time to study, keeping himself informed of every new discovery and improvement which the indefatigable researches of medical inquirers are constantly unfolding. He devoted himself with peculiar assiduity to the study of the institutes of medicine, and was a warm admirer of the writings of many of the French authors, who, while they have developed much that is erroneous and speculative, have still shed new light over many obscure and heretofore unexplored regions of our science. He was a zealous advocate of the doctrines of the phrenological school, and looked to the science of phrenology as a means whereby many of the phenomena of the diseases of the brain, which are now exceedingly obscure, or altogether inexplicable, would at some future period be satisfactorily explained. So well informed was Dr. Turnpenny in the details of this science, that he was selected by Dr. Morton to furnish an article on the phrenological developments of the different races of men, to be incorporated in his splendid work, Crania Americana: he was prevented, however, from executing his task by the invasion of disease.

In connexion with his researches on diseases of the brain, he published, several years since, a highly ingenious paper on the pathology of epilepsy, in the treatment of which intractable malady he had met with unusual success.

During the summer of 1838 Dr. Turnpenny was seized with an affection of the bowels, attended with acute pain and frequent discharges; the remedies addressed to the disease failed in producing permanent relief, and the energies of his system became greatly impaired.

After suffering for a year with the disease, he was forced reluctantly to abandon his profession, and to seek relief by a voyage to England. This expedient, from which much benefit was expected by his friends, seemed only to render his case more alarming. Soon after getting to sea, the bowel affection subsided, and was followed by symptoms indicating the development of meningitis.

He became the subject of treatment for this affection on his arrival in England; and when

he had so recovered as to render exertion admissible, he was diligently employed in seizing every opportunity whereby he could add to his stock of medical knowledge. At the time of his embarkation for this country, Dr. Turnpenny had so far regained his health as to induce the hope of his entire restoration. On the return voyage, however, his former symptoms were renewed; and very soon after his arrival he was seized with an attack of acute meningitis, which terminated his existence after an illness of sixteen days.

Agreeably to his oft-repeated request, a post mortem examination was instituted in the presence of several of his medical friends. The appearances, on dissection, indicated chronic meningitis, with decided opacity and thickening of the membranes, principally over the superior portion of the middle and anterior lobes of the cerebrum, and at the base of the cerebellum; slight lymphatic deposits were observed between the membranes at several points, with considerable serous effusion beneath the membranes and in the cavities of the ventricles. The substance of the brain presented a perfectly healthy appearance, the convolutions being unusually deep.

The mucous membrane of the colon, throughout the greater portion of its surface, was thickened, and its follicles enlarged, exhibiting evidences of chronic inflammation without ulceration, which appeared to those present to have been in the progress of recovery at the time of the patient's death. Several cicatrices, filled with calcareous deposit, were found in the upper lobe of the right lung, and one in the left,—an appearance which was the more remarkable, as no suspicion had existed of the patient having at any period been the subject of phthisis pulmonalis. The other portions of the lungs were perfectly healthy. The mesenteric glands were considerably enlarged; other viscera sound as far as examined.

In the early demise of Dr. Turnpenny, his medical brethren have lost the services of a member of their body who had devoted his life to the advancement of science, and to the support of the dignity and honour of his profession. No sordid or selfish views ever permitted him to swerve from the path of integrity, or to compromise those high principles of medical ethics which bind the medical fraternity into one harmonious body.

That one so fitted by nature and education to advance the interests of our science, should be cut off, in the very morning of existence, when his labours were just beginning to be valuable, is truly a subject of general regret. While amidst the circle of his immediate associates, regret deepens into sorrow for the loss of a friend, for whose amiable deportment, and manly virtues, they will long cherish the most lively recollection.

FOREIGN SUMMARY.

On a remarkable effect upon the Gums produced by the slow introduction of lead oxide into the human body. By Henry Burton, M. D., Physician of St. Thomas's Hospital.—In explanation of the circumstances by which the author was first induced to investigate the action of lead oxide on the gums, Dr. Burton says he had been taught to believe from the perusal of Dr. Warren's Essay on the Effects of Lead, published in 1772, and of Dr. Christison's description of the symptoms produced by the same oxide on man, published in 1829, and republished in 1836, that a salivation was occasionally excited by its slow introduction into the human body, and during which the saliva was increased in quantity, as well as rendered (according to Dr. Christison) bluish in colour.

In no other author, among several which were consulted, could Dr. Burton meet with any additional notice of unusual symptoms having reference to the state of the mouth produced by the absorption of lead oxide. But his attention was first practically directed to its influence on the salivary glands, in the year 1834, when his friend Dr. Roots, and late colleague at St. Thomas's Hospital, had a patient in one of his wards who was said to have been salivated by the internal use of plumbi acetas.

From that period to the present time, an interval of about five years, Dr. Burton has continued the examination of the mouths of patients who have been admitted into his ward with lead colic and lead paralysis; the result of which has been a belief that a salivation, in the ordinary sense of the word, does not occur in one case out of twenty-eight well marked cases of disease, from the absorption of lead oxide, which number have come under the treatment.

Dr. Burton does not deny that salivation has occurred and may occur again; but he contends that a peculiar appearance is invariably produced by lead oxide on the gums, and which may be considered as indicative of its presence in the system. On these twenty-eight patients the edges of the gums, where they were attached to the necks of two or more teeth of either jaw or both jaws, were distinctly bordered by a narrow line of a deep leaden blue colour, about the 1-20th part of an inch in width, whilst the remainder of the gums, for the most part, retained their usual colour and condition. This phenomenon, observed on the gums of patients affected by lead oxide, differs entirely from any one characteristic of the presence of mercury in the system, as well as of scorbutus; and is never seen unless the patient has been exposed to the long-continued operation of lead oxide.

In support of these opinions Dr. Burton adds, that he has intentionally produced the peculiar

appearance alluded to by the internal use of plumbi acetas, and that he was unable to distinguish it on the gums of fifty-two hospital patients under treatment for various diseases, which were not complicated with either lead colic or lead paralysis. He is, therefore, inclined to rely on this symptom as an infallible proof of the presence of lead oxide in the system; and, that in all cases of illness originating from this oxide, about the symptoms of which some ambiguity exists, an examination of the gums will materially assist in making a correct diagnosis.

The author notices briefly, the conditions of disease in which this ambiguity is sometimes remarked, and asserts that, in the majority of cases of which lead oxide is the cause of illness, a careful inspection of the gums will immediately reveal the origin of the evil, and suggest an appropriate plan of treatment.

In six cases in which plumbi acetas was administered internally by Dr. Burton, the appearance of the narrow leaden blue border line preceded the accession of other symptoms indicating the presence of lead oxide in the system; and the use of the salt was in consequence discontinued. In two of these cases colic symptoms followed its appearance, but in the remaining four they did not follow. This sign, therefore, Dr. Burton thinks cannot be implicitly relied on as a means of always averting the pains of lead colic; nevertheless, he believes it may be depended on with as much safety as the copperish taste of the saliva is confided in as an indication to withhold the farther use of calomel, for the purpose of avoiding the other symptoms of mercurial salivation.

During the discussion which ensued at the meeting of the Society after Dr. Burton's paper had been read, Dr. George Burrows stated that a corresponding colouration of the gums had been observed in Germany, and an account published of it in Fromp's Notizen, No. 246, for October, 1839.

We have been since favoured with a translation of that account, from which it appears that the author (Dr. Schilbach, of Neustadt,) in the month of August, 1839, was called into a consultation upon the health of a father and five children who had been poisoned by the use of bread containing lead oxide. On all the patients (Dr. Schilbach observed) an almost characteristic ash gray coating of the gums "at the part where they surrounded the teeth." No farther notice is taken of this appearance by Dr. Schilbach. The sentence above quoted, however, strongly confirms the accuracy of Dr. Burton's observations, whilst it in no way deprives him of the priority of discovery; and we have authority for unequivocally denying on his part any knowledge of Dr. Schilbach's paper previous to the discussion which took place at the Medical and Chirurgical Society.—*Lond. Med. Gaz.*

Aneurism of the Ascending Aorta. By M. Dubois.—At the meeting of the Royal Academy of Medicine of Paris, 5th December, 1839, M. Dubois exhibited an interesting specimen of morbid anatomy, illustrative of the tendency of aneurismal as well as other tumours, to approach the surface, notwithstanding every natural obstacle. The diseased vessel was the ascending aorta, from which, while yet within the pericardium, might be seen a tubular prolongation, of the diameter of two inches, proceeding at right angles directly outwards, and divided near its middle in two unequal parts, by a kind of circular valve. Externally, this tube communicated with a large pouch of condensed cellular tissue, lying beneath the pectoral muscles, and extending into the axilla. Three intercostal spaces had been perforated, not only the intercostal muscles, but one of the ribs having been absorbed as the tumour grew, so that the rough edges of the bone were in contact with the fibrous coagula of the aneurism.

The whistling respiration and œdema of the upper extremities observed during life clearly arose from the pressure of the tumour.

[The foregoing case confirms the truth of the observation that aneurisms of the arch of the aorta more commonly rise towards the sternal surface of the chest. Corvisart, Duverney, Morgagni, and others, have given instances of this kind.]—*Brit. and For. Med. Rev., from Bulletin de l'Académie de Médecine.* December 31, 1839.

On the Various Circumstances which appear, in the Course of Diseases, to produce the Curved Form of the Nails. By M. Vernois.—This paper is sufficient to determine the value, or rather the want of value, of curved finger-nails as a sign of disease. The results obtained from the examination, by the numerical method, of two hundred and seventy-six cases of various diseases, are as follows:

In any collection of patients, whatever be their diseases, curved nails will be found in at least one-third. Among different diseases, phthisis, scrofula, and other chronic affections, have a very marked, though not an absolute or constant influence. Of eighty-eight patients with curved nails, seventy were phthisical or scrofulous; and of one hundred and eighty-eight with normally formed nails, forty were suffering from the same conditions. Of the same eighty-eight, nine only laboured under acute diseases. Females present this alteration about three times more frequently than males. It is most commonly observed between the ages of ten and thirty. Occupation has no influence upon it. The constitution which coincides with it in five-sixths of the cases in which it occurs is that which is marked by a pale, fine, and ænemic skin, blond hair, blue or brown eyes, bluish sclerotica, very long eyelashes, and weak muscles.—*Ib.*,

from Archives Générales de Médecine. November, 1839.

On the Use of Hydrochlorate of Baryta in Strumous Ophthalmia. By Dr. Payan, of Aix in Provence.—Dr. P. having observed that this remedy was used with excellent effect by Lisfranc in scrofulous diseases, he resolved to try it in an obstinate case of ophthalmia accompanied by a high degree of photophobia. The patient was six years of age. He dissolved two grains of the hydrochlorate in three ounces and a half of "eau sucrée," and this quantity was taken in portions during the course of the day. No particular effect being produced, on the third day three grains were taken, and the dose was gradually raised to ten grains in the course of the day. On the twentieth day the medicine was discontinued, the patient being considered nearly well. In another case, twelve grains in the course of the day were taken with excellent effect, and without any symptoms of gastric irritation being produced. During the administration of the remedy, Dr. Payan orders a light and sparing diet, considering that harm is frequently done by the tonic medicines and stimulating regimen which are generally ordered as a matter of course in strumous ophthalmia. It is true that the scrofulous constitution is often accompanied by an atony which is marked by a pale and pasty complexion, feeble circulation, a low degree of sensibility, and a general indolence of mind and body; but the same scrofulous disposition is frequently developed in persons of a lively temperament, animated countenance, habitually quickened circulation, and mobile and easily excitable nervous system. It is in this latter class of persons that we most frequently find that acute sensibility of the retina which produces photophobia, with the accompanying spasmodic contraction of the eyelids, and abundant secretion of tears. In these cases, a generous diet, with wine and tonics, will increase the general excitement, and consequent irritability of the retina, whilst the barium appears to act as a sedative, and, combined with a mild diet, produces a general soothing effect.—*Ib.*, *from Revue Médicale.* April, 1839.

On the Treatment of Dysentery with Albumen. By M. Saucerotte, Physician to the Hospital at Lunéville.—The dysentery, which annually attacks a considerable number of men of our garrison, affected only thirteen in the months of October and November, 1838, and ten in those of August and September, 1839. I employed in some of these cases the albuminous method of treatment recommended by MM. Bodin de la Pichonnerie and Mondière. Comparatively with those by the ordinary method, (by antiphlogistics and opiates,) the results obtained by it were really of the most striking kind. My own experience, and that acquired by others in the hospital, shows that when the disease is at all severe, it generally lasts two or three weeks, sometimes becomes chronic, or terminates in death: besides this, the reiterated application of leeches causes severe pain, the administration of enemata is continually attended with much difficulty, the convalescence is prolonged, and attended with extreme weakness when the disease is not stopped during the first week. Judging from the cases I have observed, the albuminous treatment is attended with precisely contrary effects—rapid cessation of the symptoms, quick convalescence, and recovery of strength, while the administration is attended neither with pain nor any sort of inconvenience.

[The albumen was exhibited both as a ptisan and in enemata, according to the formula of M. Mondière, and eight cases are related (some, however, with ludicrous brevity) in support of the above emphatic encomiums. In some of the cases there was undoubted inflammation of the large intestine; in all frequent bloody stools, tenesmus, &c.]—*Ib.*, *from Gaz. Médicale de Paris.* No. xlvii. Nov., 1839.

On the Treatment of Malignant Ulcers by Cauterization with Corrosive Sublimate. By M. Ordinaire.—M. Ordinaire for the last fifteen years has been in the habit of employing the bichloride of mercury as a caustic in the treatment of cancerous, scrofulous, venereal, and other intractable ulcers, and has never observed the least symptom of absorption, which he ascribes to the instantaneousness of its destructive action on the absorbents, and to its being decomposed by the albumen of the tissues. The quantity of the powder employed varies with the thickness and the nature of the parts requiring to be destroyed, but never exceeds seven or eight grains. If the cancerous ulceration be superficial, a single application of caustic suffices; but it is generally necessary to repeat it after the separation of the eschar. He also employs this salt for the cauterization of strictures of the urethra. [The following, the third case related, is a specimen of the activity of this surgeon's practice:] M. I., innkeeper, subject from infancy to prolapsus of the gut, began at ætat twenty to experience much difficulty in reducing it after defecation, which increasing till his thirty-second year, reduction then became impossible. M. O., on examining the patient at this period, found at the orifice of the rectum a tumour as large as an egg, traversed by several deep sulci, dividing the mass into ulcerated lobes. The tumour was hardly tender to the touch, yet caused severe lancinating pain; it bled when handled, and discharged a very fœtid, icherous matter. Recognising cancerous degeneration, the author removed with a bistoury the mass protruding beyond the anus, and having ascertained that diseased excres-

cences extended two inches up the rectum, determined on removing them with the bichloride. He prepared a cylindrical plug of shredded lint of the thickness of the finger, and four or five inches long, smeared it with a glutinous matter, then sprinkled it all over with the caustic, and pushed it two inches and a half up the rectum. Severe pain soon came on, and there was great difficulty in persuading the patient to bear the plug for a few hours. Sloughs as large as an almond separated on the fourth day with the aid of injections and hip-baths, and further application of the caustic was only required to two spots at the margin of the anus, which had a suspicious appearance. The patient was entirely cured thirty-two days after the first cauterization; the sphincters performed their office well. The operation was performed twelve years since, and the patient enjoys perfect health.—*Ib.*, *from Gaz. Médicale de Paris.* No. xlvi. 1839.

Cure of an Old Dislocation of the Humerus by Division of the Pectoralis Major, Latissimus Dorsi, Teres Major, and Teres Minor Muscles. By Professor Dieffenbach.—Herr Th., a large landowner, upwards of thirty years old, had his right shoulder dislocated two years ago by a fall from his horse; the nature of the accident was not at first recognised, and afterwards, though all the usual means were adopted by several surgeons, the bone could not be returned to its place. The patient, therefore, came to Berlin; he was of a gaunt, powerful form, with a pale complexion and but little fat, and his muscles were strong and prominent under the skin. The injured right shoulder was an inch higher than the left; the acromion formed a short angle; on the outer side the shoulder was deeply hollowed, and the scapula lay flat. The right arm was thinner than the left, and stood out far from the body. The head of the humerus lay on the anterior side of the chest, close to the clavicle, and two inches from the upper portion of the sternum. The patient had a constant sensation of cold in the limb, and the creeping which he had formerly felt had ceased. The pulse in the right radial artery was rather weaker than that in the left. The limb was useless, and only the hand could perform some slight actions.

By moving the arm in different directions, severe pain was produced in the part where the head lay surrounded by a thick wall of dense ligament into which it had worked itself. In drawing the arm outwards from the body, the pectoralis major, latissimus dorsi, teres major, and teres minor, became tense with extreme pain. The last three of these muscles felt hard and tense, even when the arm was not drawn outwards. An attempt to reduce such a dislocation without dividing these muscles and the new joint would have been extremely dangerous, and had been found impossible; but (says the Professor) I anticipated success from the subcutaneous division of every thing that resisted me.

The patient being placed on the table, with one folded sheet passed under the right axilla, and held by six assistants, another fastened round the right hand and held by six more, and a third round the upper part of the humerus held by three more, (in the manner usually adopted by me in old luxations,) the two first sets of assistants were ordered to pull against each other. I next bade them make a slowly increased extension, and then stop; I then passed a small scythe-shaped knife through the skin, and divided the most tense portion of the pectoralis major close to its tendon, which yielded with a cracking sound. I then again introduced the knife at the posterior border of the axilla, and divided one after the other the latissimus dorsi, the teres major, and the teres minor. All these muscles gave way with a cracking noise, which was increased by the resonance of the chest. I next passed my knife into three places by the head of the humerus, and divided in a similar manner under the skin the dense and hard false ligaments which surrounded the new joint, and lessening the extension, I loosened the head by a few rotations.

A powerful extension was now again commenced on both sides, and the three assistants behind the patient pulled suddenly while I conducted the humerus towards the joint into which it slipped on a sudden, without again springing out. One shoulder looked now just like the other. The thorax, the shoulder, and the arm, were enveloped with bandages, which were soaked with paste, and after a few hours they all became dry and hard, and prevented any motion of the right side.

The bleeding from the wounds, which were not larger than those made in phlebotomy, was at most a few drops. No unpleasant symptoms ensued, and the patient suffered even less than the majority of persons in whom I have reduced old dislocations. On the ninth day I took off the bandage; both shoulders had exactly the same level and form, and there was neither swelling nor pain. The punctures in the axilla had completely healed, and scarcely a trace of them could be found; there was no collection of blood or pus. The arm was already capable of motion, and its actions were far less hindered than they are sometimes after the reduction of recent dislocations; because in them there is often for a long time a sensitive contraction of the unnaturally stretched muscles, while in this case the division of the resisting muscles and of the newly-formed joint not only rendered the reduction possible, but at the same time diminished its after consequences. The limb is now again restored to perfect utility.

The professor adds that he had lately occasion to reduce a luxation of the foot backwards

of upwards of a year's standing, by dividing the tendo achillis, which forcibly drew the heel upwards. This limb also became useful again.—*Ib.*, *from Medicinische Zeitung.* Dec. 18, 1839.

On the Cure of Congenital Squinting by Division of the Internal Straight Muscle of the Eye. By Professor DIEFFENBACH, of Berlin.—[The following cases are masterpieces from the hand of a master. The operation is beautiful in its simplicity, and the result delightful to contemplate. Who shall set bounds to the progress of surgery? These operations are the first of the kind ever performed on the living subject; but Stromeyer has the merit of having suggested the operation, and he performed it on the dead body, with a direct view to proving its practicability on the living.]

Case 1.—The subject of this operation was a child seven years old, whose eye was drawn far into the inner angle of the eyelids, so as to produce considerable disfigurement. The operation was performed in the following manner:—The head of the child was held against the chest of one assistant, while another with two hooks kept the eyelids widely apart. The operator then passed a third hook, which he gave to a third assistant to hold, through the conjunctiva, and to some depth in the subjacent cellular tissue at the internal canthus. He next fixed a fine double hook in the sclerotica at the inner angle, and taking it in his left hand drew the eye outwards. Then cutting into the conjunctiva close to the ball where it is continued from it to the internal canthus, and penetrating more deeply by separating the cellular tissue by the side of the sclerotica, he divided the internal rectus muscle close to its insertion with a fine pair of scissors. The eye was immediately drawn outwards by the external rectus, as if it had received an electric shock; and in another instant became straight, so that there was no difference perceptible between its direction and that of the other eye.

The hæmorrhage during the operation was but slight, though sufficient to impede it. The after-treatment consisted of cold lotions; no inflammation ensued, and within eight days the cure was completed.

Case 2.—Carl Gerhard, æt. ten, affected with squint since his fourth year. His parents wishing him to become a printer, were anxious to have this defect removed, as it interfered with composing. The right eye was so completely drawn into the inner angle, that on a first view the point of junction of the iris and sclerotica formed the centre of the anterior surface of the eyeball. By an effort the eye could be drawn from the canthus and placed straight, but could not be turned at all outwards. The operation was performed as in the last case, the conjunctiva being cut through, and the sclerotica laid bare to the extent of four lines, in order to bring the muscle into view, which was cut with a curved scissors as before. The squint was gone; the eyeball, when at rest, stood nearly straight, or rather a little turned outwards; and could be turned more readily by the patient's efforts in this direction than inwards. All the other movements of the eye were free. The bleeding was here much less than in the former case, and caused no interruption. The sudden turning of the eyeball outwards, observed in the first case, did not take place here.

The boy felt quite well on the following day. He could separate the eyelids without difficulty. The conjunctiva in the inner angle of the eye was red. The eye was nearly straight, only turned a little more outwards than the other. In eight days the cure was complete, and the eye quite straight.

Case 3.—Albert Victor, æt. fifteen, affected with strabismus of the left eye since his earliest infancy. The eyeball was turned deeply into the inner angle; but by an effort of the will it could be turned straight, but on this effort being relaxed, it instantly returned to the former position. The operation was performed precisely in the same manner, it being only here specified that the external incision in the conjunctiva was semilunar, and that the muscle was cut by introducing the pointed blade of the scissors beneath it. As soon as the hook that held the eye was removed, the ball turned at first outwards, but in a moment returned to the straight position. The edges of the wound did not gape, so that the external incision was barely perceptible. The eye was covered with a cold poultice, and the patient subjected to the antiphlogistic regimen. In eight days the cure was complete, and the squint entirely gone.—*Ib.*, *from Medicinische Zeitung.* Nov. 13, 1839, and Feb. 5 and 12, 1840.

Notice of a New Monstrosity; *A portion of a Fœtus living upon the Testicle.* By M. VELPEAU.—The case on which I propose to engage the Academy to-day, is one of the most strange that the sciences of observation have yet had to consider; interesting at once to surgery, pathology, anatomy, generation, physiology in general, it appears to be without parallel among known facts. It relates to a living portion of a fœtus fixed in the testicle of an adult, where it seems to have been developed and to have lived since his birth. This is a peculiarity so contrary to what we know, and is at first glance so incomprehensible, that one might be justified in doubting its existence if I did not possess the substantial proof of it in the preparations here presented, and if the patient and the tumour had not been observed by several hundreds of practitioners and students, and if the operation had not been performed in the presence of 500 persons. The case is, in a few words, as follows:—

A young man, named Gallochat, of Esterney, aged 27, of a good constitution, and who had never suffered from any severe disease, was sent, in the middle of January, to M. Andral, who at once passed him over to my division in the Hôpital de la Charité.

On examination, I found that the patient had a tumor, nearly as large as a fist, on the right side of the scrotum. It appeared unconnected with the substance of the testicle; the skin over it presented no analogy to that of the scrotum, and it did not appear to me to belong to any known class of tumors. Although several surgeons thought it might be referred, some to the cancerous tumors, some to the fibrous, and some to the tuberculous class, I did not think it possible to adopt their opinion. Observing, moreover, that its origin dated back to the patient's birth, that it was not perceived at its commencement, that it had never produced any pain, that no pathological process had been set up in it, and that it could be cut, or pricked, or pierced through and through, without causing the least suffering; taking notice also of the aspect of the skin which covered its external surface, of its elasticity, of the indurations which it presented internally, of a tuft of hair which came from a kind of ulcer at its posterior part, of a reddish tubercle at the bottom of another opening anteriorly, and of a glairy or grumous matter which the patient had sometimes dischaged; I came to the idea that it was a *fœtal tumor, a product of conception.*

Wishing to obtain exact information on the earliest history of so singular a production, I wrote to M. Senoble, physician at Esternay, who answered me thus:—"At the age of about four months, the mother of Gallochat came to show me her child; he then had a tumor, or merely a swelling of the scrotum, which I found to be only a pneumatocele. Some months afterwards, I found, on examining him again, a small inflamed tumor, which appeared to me to be a slight phlegmon, and which yielded to simple emollient local applications. I heard no more of him till at the end of three or four years, when I learned that the child's tumor still continued enlarging." Now although these details were very incomplete, they yet strengthened me in my first opinion; which seemed so singular to those to whom I mentioned it, that I alone held it. I therefore planned the removal of the tumor without taking away the testicle, intending to perform a kind of *Cæsarean operation on the man.* The details of the proceeding belong entirely to surgery, and need not now occupy me; it may be sufficient to state that its results were satisfactory.

The examination of the tumor has enabled me to detect nearly all the anatomical elements of the body of a mammal. Thus, its external layer is evidently cutaneous; the greater part of its substance is a mixture of lamellæ and fibres which give the idea of the cellular, adipose, musular, and fibrous tissues. In its interior, we found two small cysts filled with matter like albumen or the vitreous humour of the eye; another cyst, as large as a partridge's egg, contained a greenish yellow and semiliquid matter like meconium; in a fourth sac there was a grumous substance, of a dirty-yellow colour, concrete, and surrounded with hair. The substance from this last sac, when analyzed and examined with the microscope, presented all the characters of sebaceous matter and scales of epidermis. The hairs did not appear to have any bulbs at their bases. The tuft of hair which was seen externally, protruded from one of these cysts—from that which was filled with greenish matter; and the opening in it had some analogy with an anus.

Lastly, in the midst of all these elements, we found numerous portions of the skeleton perfectly organized, evidently belonging (as any one may convince himself by examining the preparation) to true bones, and not to accidental productions. These bones, which were every where enveloped by a sort of periosteum, and of which the several pieces were moveable upon each other, and had distinct articulations, may be divided into three sets. The first group is essentially composed of three pieces, in which I thought I could recognize the clavicle, the scapula, and a part of the humerus. The second group, much larger than the preceeding, appears to belong to the pelvis, or perhaps to the base of the skull; the body of the sphenoid, or else the sacrum, forms the central portion. Lastly, the third series seems to comprehend portions of vertebræ and fragments of undetermined bones.

Whatever be the name that the different portions I have pointed out may deserve, certain it is that they belong to a product of conception, and to a fœtus already far advanced in its developement. They are before the Academy, and the correctness of the fact is absolutely incontrovertible. In the monstrosity by inclusion, as it is called, which has been described by Dupuytren, Geoffroy, and Ollivier, one of the fœtuses absorbed by the other has always appeared surrounded by a cyst, and in the condition of a foreign body in the tissues of the fœtus which has continued alive. In the cases related by Saint-Donat, Prochaska, and others, of the debris of fœtus contained in the scrotum, there have always been encysted tumors, necrosed bones, and organized parts destroyed by suppuration and in a state of decomposition. In this subject, on the contrary, every thing has continued to live. The anormal tumor had its own proper colour, consistence, and sensibility, entirely independent of the individual who supported it; a clear well-defined line separated the integuments of its skin from the scrotum. I pinched it with all possible force; I pricked it with various

instruments: the young man himself several times ran a knife into it, without feeling the least painful sensations; and yet all the wounds that were made in it bled abundantly, inflamed, and cicatrized, like those of any other part of the body, and nothing indicated in it the least diseased condition. The substances, and all the elements that were found in it, gave the idea of normal tissues or products, and we were quite unable to discover the existence of the least drop of pus, or of any carious or necrosed bone, any altered cartilage, or the least fungous production.

When, on the other hand, one observes that the tumor was as large as a fist—that the surgeon who saw the child when four months old scarcely took notice of it, and that he took it at first for a pneumatocele, and then for a little phlegmon, which terminated by resolution—it is difficult to believe that its volume was as considerable at the birth of the patient as it was the time when I first saw it. Such a mass in an infant would certainly have attracted great attention both from the physician and the family. We must remember, moreover, that, according to M. Senoble's statement, the tumor continued to grow at least up to the age of six or seven years, and that the young man, who says that it has always had the same appearance, can scarcely charge his memory so far back as that time of his life: we must therefore conclude that the portions of the fœtus which I have described have lived and been developed simultaneously with the individual who bore them, and that there were thus two beings united to one another.

Now how could this take place? Did a part of the fœtus, the remainder of which has disappeared, become attached, during intra-uterine life, to the scrotum, in such a manner as to remain there in the form of a graft?—or can this be the remains of a fœtus which at first passed into the abdomen of another, and then descended by the tunica vaginalis, and has at last worn away from within outwards the envelopes of the scrotum?—or, lastly, have we here a creation, the unaided product, of the testicle? But I desist; these are delicate questions in high physiology and in transcendental anatomy, which I am neither able nor willing to broach till the preparations which suggest them have been submitted to the judgment of the Academy.—*London, from Paris Medical Gazette, Feb.* 15, 1840.

Case of Dislocation of the Elbow, in which the Radius and Ulna were thrown forwards, with Fracture of the Ulna. By M. Richet.—A man fell from a high scaffold, as it was supposed, on his back and the palm of the left hand, and was admitted into the Hôpital St. Louis, in a state of partial collapse.

On examining the bend of the elbow, a hard oblong tumour was seen a finger's breadth above the condyles of the humerus, elevating the biceps and brachialis internus, and rendering the brachial artery comparatively superficial. This tumour was moveable on bending and extending the fore-arm, and rolled under the finger towards the radial side during supination and extension, giving rise to an indistinct crepitation. The olecranon was prominent, moveable transversely, but maintained its natural position. On tracing the edge of the ulna downwards, a flesh-wound was seen two fingers' breadth below the olecranon, through which the bone protruded. The condyles of the humerus, though preserving their natural relations with the posterior part of the ulna, projected considerably, so as to stretch the skin.

The dislocation being immediately recognised as that of the radius and ulna forwards, with fracture of the ulna, was easily reduced by extending the fore-arm, and then suddenly and forcibly bending it, at the same time forcing the upper extremities of the radius and ulna downwards and backwards. All deformity quickly vanished, the bones having regained their natural position, when, in consequence of extension having been remitted, an involuntary contraction reproduced the dislocation with the utmost ease. It was again reduced, and kept so, by means of a cushion, and bandage surrounding both forearm and arm—the forearm being bent at a right angle with the arm, and the cushion filling up the angle and keeping the bones in place—at the same time a splint was applied along the inner side of the joint. The patient died three hours after, from the other injuries received.

On examination, it was found that the triceps was firmly attached to the whole of the posterior fragment of the ulna, as were also the extensor carpi ulnaris and anconæus, thus accounting for the natural position of the olecranon. A longitudinal fracture was seen, somewhat oblique, from above downwards, and from before backwards, running along the middle of the sigmoid cavity to the external border of the ulna, and thence backwards and inwards to a point a finger's breadth below the olecranon, which was the part that had protruded.

The ulna was thus divided into two fragments, the larger formed by the body, surmounted by the coronoid process; the smaller and posterior by the olecranon, and an inch and a half of the ulna below it, ending in a point, which constituted the protrusion. The radius and ulna were seen on the front of the humerus, half an inch above its condyles. The capsular ligament was torn throughout, which explained the easy reduction and reproduction of the luxation.

[This case is worthy of remark, since it proves the possibility of a dislocation of the elbow forwards *without* fracture of the olecranon, contrary to the assertion of Sir A. Cooper and others.]—*Archives Générales de Médecine.*